

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1-33. (Cancelled)

34. (Currently Amended) A method of assembling tyres for vehicle wheels, comprising:

assembling a carcass structure;

disposing a belt structure on an auxiliary drum;

picking up the belt structure from the auxiliary drum by a transfer member to transfer the belt structure to a position coaxially centered with respect to the carcass structure;

shaping the carcass structure from a substantially cylindrical form into a toroidal configuration to couple the carcass structure to the coaxially centered belt structure;

applying a tread band onto the belt structure; and

applying a pair of sidewalls to the carcass structure on opposite sides of the carcass structure;

wherein the carcass structure comprises at least one carcass ply in engagement with annular anchoring structures axially spaced apart from each other,

wherein the belt structure comprises at least one belt layer,

wherein applying the tread band is carried out by winding at least one continuous strip element of elastomer material in contiguous circumferential coils around the belt structure,

wherein the at least one continuous strip element is supplied by at least one delivery member,

wherein applying the tread band and applying the pair of sidewalls are cyclically carried out by ~~the at least one delivery member~~ following a controlled rate on each of a first primary drum and a second primary drum, wherein each of the first primary drum and the second primary drum ~~[[are]] is~~ independently movable ~~to the at least one delivery member, each primary drum starting~~ from a position at which the primary drum interacts with the transfer member to a position at which the primary drum interacts with the at least one delivery member, and

wherein a step of disposing the carcass structure on one of the first and second primary drums is carried out before completing assembling of a tyre on the other of the first and second primary drums.

35. (Cancelled)

36. (Previously Presented) The method of claim 34, wherein applying each of the pair of sidewalls is carried out by winding at least one second continuous strip element of elastomer material in contiguous circumferential coils around the carcass structure.

37. (Previously Presented) The method of claim 34, wherein applying the pair of sidewalls is carried out after the carcass structure has been shaped into the toroidal configuration.

38. (Previously Presented) The method of claim 34, wherein applying the pair of sidewalls is carried out after applying the tread band.

39. (Previously Presented) The method of claim 34, wherein applying the pair of sidewalls is carried out before applying the tread band.

40. (Previously Presented) The method of claim 34, wherein the at least one strip element is fed from the at least one delivery member, the at least one delivery member being disposed close to the tyre being assembled, simultaneously with winding up the at least one strip element around a geometric axis of the carcass structure.

41. (Previously Presented) The method of claim 40, wherein feeding the at least one strip element is carried out by extrusion through the at least one delivery member.

42. (Previously Presented) The method of claim 40, further comprising:
giving one of the first and second primary drums a circumferential-distribution rotary motion around a geometric rotation axis of said one of the first and second primary drums, so that the at least one strip element is circumferentially distributed around the geometric axis of the carcass structure; and

carrying out controlled relative transverse-distribution displacements between said one of the first and second primary drums and the at least one delivery member, so that the at least one strip element forms a plurality of coils disposed in mutual side-by-side relationship;

wherein giving said one of the first and second primary drum drums the circumferential-distribution rotary motion and carrying out the controlled relative transverse-distribution displacements are carried out concurrently with winding up the at least one strip element.

43. (Previously Presented) The method of claim 42, wherein the controlled relative transverse-distribution displacements are carried out by movement of said one of the first and second primary drums.

44. (Previously Presented) The method of claim 42, wherein the circumferential-distribution rotary motion and the controlled relative transverse-distribution displacements are carried out by an actuating assembly engaging said one of the first and second primary drums.

45. (Previously Presented) The method of claim 34, wherein after transferring the belt structure to a position coaxially centered with respect to the carcass structure and before winding up the at least one strip element, one of the first and second primary drums is moved towards the at least one delivery member.

46. (Previously Presented) The method of claim 40, further comprising:
moving one of the first and second primary drums away from the at least one delivery member to a position near devices for disengaging the tyre from said one of the first and second primary drums.

47. (Previously Presented) The method of claim 34, further comprising:
transferring one of the first and second primary drums to a region between at least one first delivery member for applying the tread band and at least one second delivery member for manufacturing the sidewalls.

48. (Previously Presented) The method of claim 34, wherein assembling the carcass structure, shaping the carcass structure, applying the tread band, and applying the pair of sidewalls are cyclically carried out following a controlled rate on each of the first and second primary drums.

49. (Previously Presented) The method of claim 34, wherein assembling the carcass structure comprises:
forming the carcass structure on a building drum; and
transferring the carcass structure from the building drum to one of the first and second primary drums.

50. (Previously Presented) The method of claim 49, wherein transfer of the carcass structure from the building drum to said one of the first and second primary drums is carried out after engagement of the belt structure with the carcass structure.

51. (Previously Presented) The method of claim 49, wherein forming the carcass structure comprises:

associating auxiliary inserts for elastic support with the at least one carcass ply;
wherein each of the auxiliary inserts comprises:
a radially internal edge disposed close to one of the annular anchoring structures; and
a radially external edge disposed close to a side edge of the belt structure.

52. (Previously Presented) The method of claim 34, further comprising:
applying the belt structure to the carcass structure; and
pressing the belt structure against the carcass structure to obtain better adhesion of the belt structure against the carcass structure.

53. (Previously Presented) The method of claim 34, further comprising:
storing carcass structures in engagement with respective belt structures;
wherein the storing is carried out before at least one of applying the tread band and applying the pair of sidewalls.

54. (Currently Amended) An apparatus for assembling tyres for vehicle wheels, comprising:

a first primary drum;

a second primary drum;

at least two actuating assemblies;

an auxiliary drum;

a transfer member;

at least one unit for applying a tread band onto a belt structure; and

at least one unit for applying a pair of sidewalls against opposite lateral walls of a carcass structure;

wherein each of the first and second primary drums is arranged to support the carcass structure,

wherein the carcass structure comprises at least one carcass ply in engagement with annular anchoring structures axially spaced apart from each other,

wherein the auxiliary drum is set to carry the belt structure,

wherein the transfer member moves the belt structure from the auxiliary drum to the carcass structure,

wherein the at least one unit for applying the tread band comprises at least one delivery member,

wherein the at least one delivery member lays down at least one continuous strip element of elastomer material in contiguous circumferential coils around the carcass structure,

wherein the first primary drum is engaged by a first actuating assembly,

wherein the second primary drum is engaged by a second actuating assembly,
wherein each of the first and second primary drums is independently movable by its respective actuating assembly to interact sequentially with devices for disposing the carcass structure, the at least one unit for applying the tread band, and the at least one unit for applying the pair of sidewalls, and

wherein each actuating assembly is arranged to cause translation of its respective primary drum towards said at least one delivery member starting from a position at which its respective primary drum interacts with the transfer member to a position at which its respective primary drum interacts with the at least one delivery member.

55. (Previously Presented) The apparatus of claim 54, wherein the at least one delivery member comprises at least one extruder.

56. (Previously Presented) The apparatus of claim 54,
wherein at least one of the first and second actuating assemblies is associated with the at least one delivery member,

wherein the at least one of the first and second actuating assemblies drives at least one of the first and second primary drums in rotation around a geometric axis of the at least one of the first and second primary drums so that the at least one strip element is circumferentially distributed onto the carcass structure, onto the belt structure, or onto the carcass structure and onto the belt structure, and

wherein the at least one of the first and second actuating assemblies causes controlled relative transverse-distribution displacements between the at least one of the first and second primary drums and the at least one delivery member for distributing the at least one strip element to form the circumferential coils disposed in mutual side-by-side relationship.

57. (Previously Presented) The apparatus of claim 56, wherein the at least one of the first and second actuating assemblies operates on the at least one of the first and second primary drums to move the at least one of the first and second primary drums relative to the at least one delivery member.

58. (Previously Presented) The apparatus of claim 57, wherein the at least one of the first and second actuating assemblies is integrated into a robotized arm engaging the at least one of the first and second primary drums.

59. (Previously Presented) The apparatus of claim 57, wherein the at least one of the first and second actuating assemblies comprises:

a carriage movable along a guide structure between a first position and a second position;

wherein in the first position, the carriage supports the at least one of the first and second primary drums near devices for disposing the carcass structure, and

wherein in the second position, the carriage supports the at least one of the first and second primary drums near the at least one delivery member.

60. (Cancelled)

61. (Previously Presented) The apparatus of claim 54, further comprising:
at least one first delivery member designed to form the tread band; and
at least one second delivery member designed to form the pair of sidewalls.

62. (Cancelled)

63. (Previously Presented) The apparatus of claim 54, further comprising:
a building station for forming the carcass structure on a building drum; and
devices for transferring the carcass structure from the building drum to at least
one of the first and second primary drums.

64. (Previously Presented) The apparatus of claim 63, wherein the devices for
transferring the carcass structure comprise:

a storage magazine; and

an auxiliary transfer member;

wherein the auxiliary transfer member transfers the carcass structure from the
building drum to the storage magazine.

65. (Previously Presented) The apparatus of claim 54, further comprising:
devices for associating auxiliary elastic-support inserts with the at least one
carcass ply;

wherein each of the auxiliary inserts comprises:

a radially internal edge disposed close to one of the annular anchoring structures; and

a radially external edge disposed close to a side edge of the belt structure.

66. (Previously Presented) The apparatus of claim 54, wherein the transfer member moves the belt structure from the auxiliary drum to the carcass structure disposed on at least one of the first and second primary drums.

67. (Previously Presented) The method of claim 34, wherein applying the pair of sidewalls is carried out by winding at least one continuous strip of elastomer material in the form of contiguous circumferential coils around the carcass structure disposed on one of the first and second primary drums.

68. (Previously Presented) The apparatus of claim 54, wherein the at least one unit for applying the pair of sidewalls comprises said at least one delivery member.